North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

Don Van der Vaart
Secretary

March 10, 2015

Mr. Tim Grant, P.G.
Marshall Miller & Associates
5900 Triangle Drive
Raleigh, North Carolina 27617

Re: Request for Work Plan & Cost Proposal for Task Order **787DP-8** and **787DP-9**
Subsurface Gas & Groundwater Monitoring, CR-6 and Soil/Waste Character Study
Rocky Knoll School Site
1231 Benbow Rd, Durham, Durham County, NC
ID# NONCD0000787

Dear Mr. Grant:

Submit a task work plan and cost estimate to perform remedial investigation-contaminant delineation phase activities at the above referenced site. Conduct these activities in accordance with your State Contract N11001S.

**Investigation Goals:** Installation of groundwater monitoring wells, monitoring subsurface landfill Gas, and conduct soil characterization, soil Asbestos and hexavalent chromium study at the site.

**Scope of work for Task Order 787DP-8A:**

- Prepare a work plan in accordance with *MMA/Cardno's* approved standard operating procedures of January 10, 2010, and include a schedule of daily activities.
- Submit an itemized cost estimate that identifies personnel and materials involved.
- Reference the most recent Guidelines for Addressing Pre-Regulatory Landfills and Dumps for details regarding procedures.
- Ensure personnel in the field are qualified to identify contaminated material and landfill waste and comply with OSHA-required health and safety training.
- Before task activities begin, photograph areas or objects that may be disturbed. If needed, photograph affected areas and objects, restoration efforts, and noteworthy items encountered during task activities. Submit these photographs upon completion of the activities, and a review will determine if any need to be included in the report.
- Collect GPS coordinates along the waste disposal boundary. Report coordinates in decimal degrees to the seventh order using the North American Datum of 1983 (NAD83) format and latitude and longitude using WGS 84 format. These coordinates will be tabulated and included as an appendix. The tabulated coordinates for the landfill perimeter should start at the northernmost point of the perimeter and be listed in a clockwise progression around the perimeter.
- Include background (light grey) topographic contour lines on figures detailing the Site and Site vicinity.
- For any invasive activities, provide a plan to properly manage investigation derived waste (IDW). If sampling results indicate non-hazardous IDW, spread within the waste disposal area. If sampling results indicate hazardous IDW, analyze containerized waste as required by waste hauler and

include details of sampling and disposal of drums in the proposal. Remove all drummed waste and associated fencing from site within 90 days after field activities are concluded.

- For any field work, minimize the clearing of vegetative material to enable access to proposed sampling points. Using hand tools for clearing is the preferred method, otherwise an explanation must be provided for use of heavy equipment.
- Submit samples to a North Carolina-certified laboratory and analyze for the following parameters by the most current U.S. EPA Contract Laboratory Program Target Compound List: volatile organic compounds by SW-846 method 8260, semi-volatile organic compounds by SW-846 method 8270, 14 metals by SW-846 method 6020, mercury by method 7471, ammonia by SM 4500, nitrate and sulfate by EPA Method 300, hexavalent chromium by Method 7196, and 1,4-Dioxane by Method 8260 SIM. Please note that any alternate method should be the U.S. EPA Method having the lowest detection limit and that at least achieves the detections equivalent to the 15A NCAC 2L standards or where these are not available, then federal maximum contaminant limits (MCLs). Soil analysis methods must meet the IHSB Preliminary Soil Remediation Goals Table
- Note: once all contaminants are determined, laboratory analysis may be reduced to those positively identified contaminants.

**Task Order 787DP-8B:** Installation of Groundwater Monitoring Wells:

a) Advance and install **8 permanent** groundwater monitoring wells (2" in diameter) at the approximate locations of **MW-1, 3, 4, 8, 10A, 22, 26 & 41**), and **8 temporary** groundwater monitoring wells **(TW-5B, -8C, -9, -13B, -16A, -21C, -42 & -43)** as shown on **Appendix 1**. Depth to groundwater is estimated between 4 and 14 feet bgs. Hollow stem augers may be required to advance the borings. Well installation must comply with the most current 15A NCAC 2C well construction standards. Construct wells with flash-mounted covers.

b) Log each boring in the field. Boring log information will include but is not limited to; top of ground elevation, detailed soil description and lithology at depths, depth of groundwater observed during drilling, notable reaction of drill rig during advancement, depth of competent rock encountered, detailed notes/remarks, and a well construction diagram.

c) Determine ground water elevation for each well and collect water level measurements using all available groundwater wells.

d) Collect one groundwater sample from each well to submit for laboratory analysis.

e) Provide well construction details in a table and include installation date, top of casing elevation, ground surface elevation, total well depth, well screen interval, depth to groundwater, and groundwater elevation.

**Task Order 787DP-8C:** Monitoring of Subsurface Landfill Gas:

a) Conduct subsurface landfill gas monitoring at the **7 existing** permanent gas monitoring locations of **GP-1, 3, 4, 8, 10A, 22** & **26,** (where **GP-4** and **GP-8** are flux chamber mounts), as shown on **Appendix 1**.

b) Using field instruments, screen the landfill gas probes for volatile organic compounds (VOCs), methane, oxygen, carbon dioxide, barometric pressure and hydrogen sulfide.

c) Screen new landfill gas probes at least 24 hours after installation.

d) Compare landfill gas probe screening results with the IHSB Residential Vapor Intrusion Screening levels.

e) Do not abandon the gas probes following screening. A review of the field testing results will determine subsequent sample collection.

**Task Order 787DP-8D:** Soil/Waste Characterization at Additional Locations:

a). While advancing the groundwater monitoring well borings, collect soil media samples from the following **4** borings (**MW-4, TW-13B, MW-41, TW-43**) as shown on the accompanying figure

(**Appendix 1)**. Please consider a truck mounted drill rig to minimize surface impacts. Advance the borings to the depth of 12 feet below ground surface (bgs). Collect one additional solid media sample from the base of waste and one from native soil beneath waste.

b). Collect **5** sets of soil/waste samples from the **4** soil borings for analysis of VOCs, SVOCs, 14 metals, nitrate, ammonia, sulfate, mercury, and 1,4-Dioxane, which should be taken continuously from the boring cores at the following **5** depth intervals of 0.0'~2.5', 2.5'-5.0', 5.0'-7.5', 7.5'-10.0', and 10.0'~12.0' bgs, or stop at the refusal.

**Task Order 787DP-8E:** Sampling and Analysis of Soil Hexavalent Chromium:

a). While advancing the landfill gas monitoring well borings, also collect soil hexavalent chromium samples from the same **3** borings (**MW-10A, MW-26 & MW-41**) as shown on the accompanying figure (**Appendix 1)**.

b). Collect **3** sets of soil samples from the **3** soil borings for analysis of hexavalent chromium which should be continuously taken from the boring cores at the following **3** depth intervals of 0.0'~3.0', 3.0'~7.0', 7.0'~10.0'bgs.

c). Soil hexavalent chromium samples may be analyzed by Method 7196.

**Task Order 787DP-9:**

Assemble a report under Task Order 787DP-9. Name the report: "*Remedial Investigation: Groundwater and Subsurface Landfill Gas Monitoring, Soil/Waste Characterization, and Soil Hexavalent Chromium Study*" that provides the information in and results of the activities. Upon review and approval of the cost proposal, a task authorization to proceed will be issued. Please note that the report should contain the following items:

a). A section concerning any variations from the work plan or your SOPs.

b). Sample analytical results tables indicating BDL or ND for non-detects. Present results to match the lab report.

Provide the work plan and cost estimate in seven (7) days after receiving this request. A task authorization to begin work will be provided once my review is completed. Please call me at (919) 707-8347 with any questions regarding this request.

Sincerely,

Zi-Qiang Chen, PhD, Environmental Engineer II
Division of Waste Management, NCDENR

**Appendix 1. Groundwater and Subsurface Gas Monitoring, Soil/Waste Characterization, and Soil Asbestos & Hexavalent Chromium Studies in 787DP-8.**